REMARKS

Claims 1, 3-9 and 11-18 are pending in the application.

Independent claims 1, 9, and 17 are currently amended.

Claims 1, 3-9, and 11-18 stand rejected under 35 U.S.C. §112, second paragraph.

Claims 1, 4-7, 9, and 12-17 stand rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 6,055,513 to Abe.

Claims 3, 11, and 18 stand rejected under 35 U.S.C. §103(a) as unpatentable over Abe, in view of U.S. Patent No. 6,125,339 to Reiser et al., hereinafter, Reiser.

Applicants respectfully traverse the rejections based on the following discussion. The following paragraphs are numbered for ease of future reference.

I. The 35 U.S.C. §112, Second Paragraph, Rejection

[0001] Claims 1, 3-9 and 11-18 stand rejected under 35 U.S.C. §112, second paragraph.

[0002] The Office Action states, "The independent claims mention customer activities across multiple channels upon which promotions are targeted and delivered, however, it is unclear how a one-way channel such as a catalog or direct marketing can be used in this way. A response to a direct marketing piece has not been addressed. In addition, when a customer responds to a catalog, he/she does so by switching from the one way catalog channel to a telephonic or web channel upon which an offer is made. This subject matter continues to be indefinite." (Office Action, mailed 112/22/2009, pages 2-3).

[0003] Applicants have currently amended the independent claims to delete catalogs and direct marketing as channels, i.e., "wherein said multiple channels include media through which a merchant reaches and interfaces with customers, said multiple channels including any of a store, a telephone, and an on-line personal computer". Therefore, Applicants respectfully assert that to one of ordinary skill in the art the "two way" channels of a store, a telephone and an on-line computer represent channels through which a customer request may be received and a channel-specific promotion sent.

[0004] For at least the reasons outlined above, Applicants respectfully submit that to one of ordinary skill in the art, independent claims 1, 9, and 17, and dependent claims 3-8, 11-16, and 18, particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Therefore, Applicants further respectfully submit that claims 1, 3-9, and 11-18 fulfill the statutory requirements of 35 U.S.C. §112, second paragraph. Withdrawal of the rejection of claims 1, 3-9, and 11-18 is respectfully solicited.

II.   The Prior Art Rejections

A.   The 35 U.S.C. 102(b) Rejection over Abe

1.   The Abe Disclosure

[0005] It is a fact that Abe discloses, "A system and method for sequential decision-making for customer relationship management includes providing customer data including stimulus-response history data, and automatically generating actionable rules based on the customer data. Further, automatically generating actionable rules may include estimating a value function using reinforcement learning." (Abstract).

[0006] It is a fact that Abe discloses, "The present invention includes an inventive method for sequential decision making (e.g., sequential cost-sensitive decision making) for customer relationship management. The inventive method includes providing customer data (e.g., consumer data, client data, donor data, etc.) comprising stimulus-response history data, and automatically generating actionable rules based on the customer data. Further, automatically generating actionable rules may include estimating a value function using reinforcement learning (e.g., reinforcement learning and dynamic programming). ... ." (paragraph [0014]).

[0007] It is a fact that Abe discloses, "Further, the actionable rules may be generated using reinforcement learning based on a Markov Decision Process model with function approximation. For example, the batch reinforcement learning with function approximation may be based on Q-learning and/or sarsa-learning. For example, the batch reinforcement learning may be based on training data including sequences of states, actions, and resulting rewards." (paragraph [0017]).

[0008] It is a fact that Abe discloses, "In another aspect, the inventive method may include preparing customer data including stimulus-response history data, and using the customer data to output instance-in-time targeting rules (e.g., of general if-then style), so as to approximately maximize expected cumulative profits over time." (paragraph [0018]).

[0009] It is a fact that Abe discloses, "Further, the inventive method may be applied to cross-channel optimized marketing (CCOM). For example, the inventive method may include providing customer data including stimulus-response history data from a plurality of channels (e.g., "multiple" channels), integrating the customer data, and automatically generating channel specific actionable rules based on the customer data. For instance, in this case the method may optimize (e.g., nearly optimize) cross-channel cumulative profits." (paragraph [0019]).

[0010] It is a fact that Abe discloses, "Further, providing customer data may include generating a sequence of event data which may include a customer's demographic features, and features, derived from the customer's stimulus-response history data, which collectively reflect the state of said customer at a certain point in time, an action (e.g., a marketing action) taken at or around that time by an entity (e.g., a seller such as a retailer), a response taken by the customer at or around a time of an event, and an amount of profit realized by the entity and associated with said action." (paragraph [0020]).

[0011] It is a fact that Abe discloses, "Further, providing customer data may include selecting customer data. For example, a value estimation may repeatedly call a data selection module one or more times per each iteration of a value iteration. In addition, the data selection module may access a customer and transaction history data set stored in a data storage device, and use a selection criteria to select a restricted subset for use in a value function estimation." (paragraph [0023]).

[0012] It is a fact that Abe discloses, "In addition, an n-step look ahead may be used in a value function update procedure within a value estimation module, in combination with a selective sampling with n-step look ahead. Further, the customer data may include transaction history data from multiple channels. For instance, providing customer data may include selecting customer data by accessing a number of channel specific databases, and forming an effective joining of data using a form of customer identification as a key." (paragraph [0025]).

[0013] It is a fact that Abe discloses, "In another aspect, the inventive system may include a customer transaction cache for storing customer transaction data including stimulus-response history data, a customer profile cache for receiving an output of the customer transaction cache and storing current customer profile data, and a customer relationship management system, for receiving an output of the customer profile cache and customer relationship management rules, and execute the action specified by a rule that is identified as applicable. In this system, for example, the customer relationship management rules may be automatically generated based on the customer transaction data." (paragraph [0029]).

[0014] It is a fact that Abe discloses, "Batch Reinforcement Learning with Function Approximation [:] In the foregoing description of reinforcement learning, two simplifying assumptions were made that are not satisfied in the current setting. The first assumption is that the problem space consists of a reasonably small number of atomic states and actions. … In many practical applications, including targeted marketing, it is natural to treat the state space as a feature space with a large number of both categorical and real-valued features. In such cases, the state space is prohibitively large to represent explicitly, which renders the above methods impractical." (paragraphs [0096]-[0097]).

[0015] It is a fact that Abe discloses, "The second assumption that was made is the availability of online interaction with the environment. In applications like targeted marketing, this situation is typically not the case. In fact, it is quite the opposite. In targeted marketing, one usually has access to a very large amount of data accumulated from past transaction history from which an effective targeting strategy is to be derived. Moreover, the targeting strategy (i.e., the policy) must make simultaneous decisions for an entire population of customers, [not] one customer at a time. Online learning of policies, via reinforcement learning or otherwise, is not practical under these circumstances." (paragraph [0098]).

[0016] It is a fact that Abe discloses, "Bearing these factors in mind, the inventors propose to use so-called batch reinforcement learning methods with function approximation. Batch reinforcement learning refers to a form of reinforcement learning in which the learning does not take place in an online fashion as the learner performs actions and the environment traverses states. Instead, batch learning makes use of a potentially large volume of static training

data that represents prior experience. The training data consists of sequences of states, actions, and resulting rewards. Batch learning thus reflects the realities of certain real-world applications like targeted marketing." (paragraph [0099]).

[0017] It is a fact that Abe discloses, "Referring again to the drawings, FIG. 14 illustrates an inventive system 1400 for sequential decision making for customer relationship management according to the present invention. As shown in FIG. 14, the inventive system 1400 includes a database 1410 for storing customer data. As noted above, such data may include, for example, age, income, gender, etc., and stimulus-response history data. The system 1400 also includes a processor 1420 for automatically generating actionable (e.g., targeting) rules based on the customer data. Specifically, the processor 1420 may generate the actionable rules by estimating a value function using reinforcement learning (e.g., reinforcement learning and dynamic programming)." (paragraph [0167]).

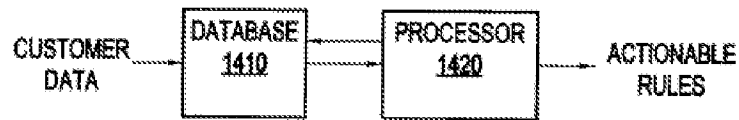[0018] It is a fact that FIG. 14 of Abe discloses,

FIG.14

[0019] It is a fact that Abe discloses, "FIG. 15 illustrates one example of a system according to present invention. In this example, targeted marketing rules are automatically generated for customers. As shown in FIG. 15, the customer transaction data (1505) are transformed to create derived features (1510). These features are used to develop current customer profile data (1570) and combined historical customer profile and stimulus response data (1515). Data mining (1520) is performed on this data (1515) to develop stimulus-response models (1525)." (paragraph [0169]).

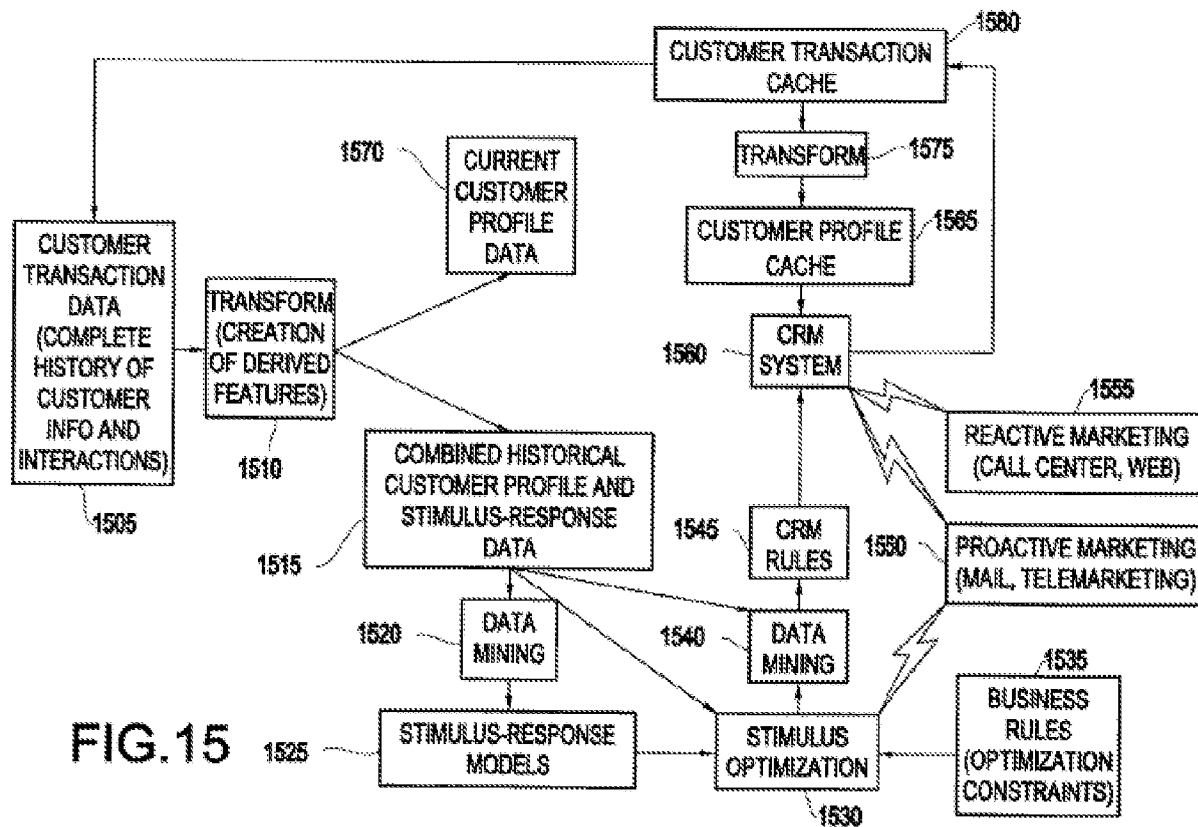[0020] It is a fact that FIG. 15 of Abe discloses,

FIG.15

[0021] It is a fact that Abe discloses, "Further, blocks 1560, 1565, 1575, and 1580 represent an exemplary embodiment of an operational CRM system for utilizing the targeting rules that are produced by the invention. This operational CRM system is depicted as having its own transaction (1580) and profile (1565) data caches in order to enhance its run-time execution speed by reducing the number of queries that would otherwise have to be issued against the main database (1505) if the data caches were not present." (paragraph [0177]).

[0022] It is a fact that Abe discloses, "FIG. 24 illustrates one possible infrastructure for the present invention including CCOM. For example, in this example, the channels include the web, kiosk, direct mail, a call center, and a store. The rules from the customer relationship management (CRM) rule base are applied to operational transactions to transform into customer profiles (e.g., operational and historical) at a point in time. The customer lifetime value is modeled to predict customer behavior. These models are transformed into situation-action rules which may be used to update the CRM rule base." (paragraph [0197]).

[0023]   It is a fact that FIG. 24 of Abe discloses,

FIG.24
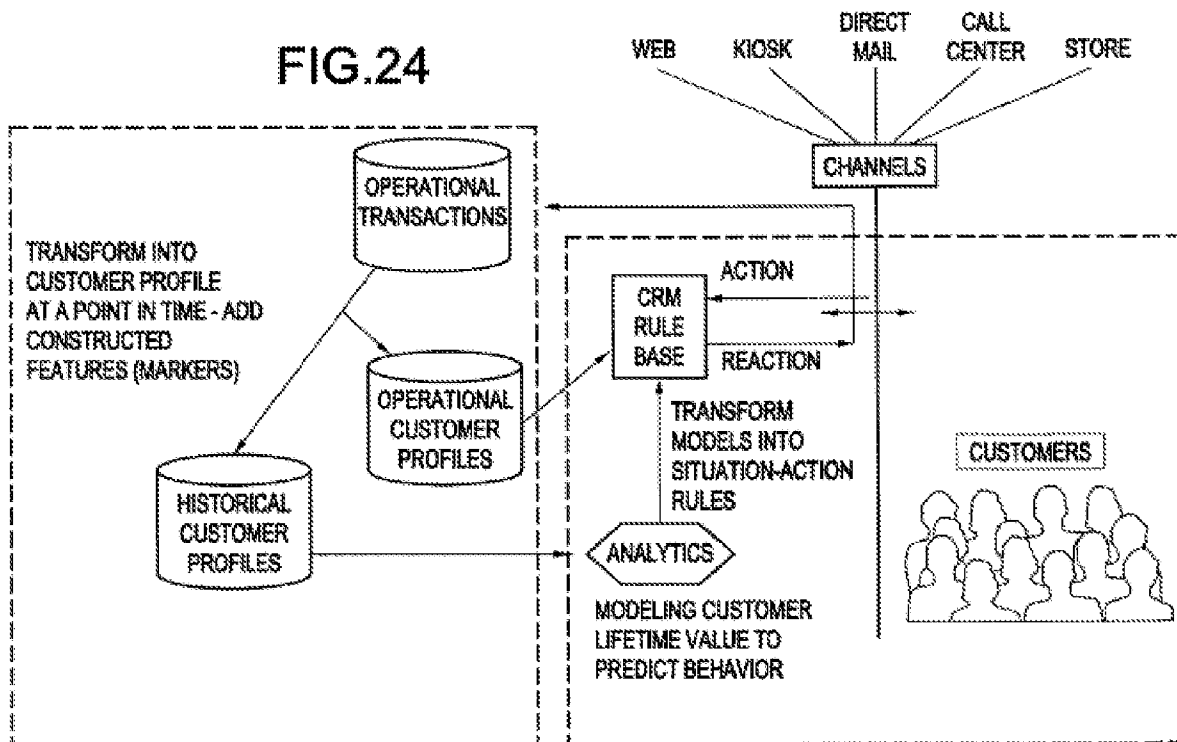
2.   Argument

[0024]   Abe discloses a system and method for sequential decision-making for customer relationship management that includes providing customer data including stimulus-response history data, and automatically generating actionable rules based on the customer data, in which automatically generating actionable rules may include estimating a value function using reinforcement learning. (Abstract).

[0025]   Abe also discloses that generating the actionable rules, which result from reinforcement learning, does not take place in an online fashion (Paragraph [0099]), because (1) the prohibitively large state space for many customers over periods of time renders targeted marketing impractical (paragraphs [0096]-[0097]), and (2) online learning of policies, via reinforcement learning, is not practical for large populations of customers and their transaction histories (paragraph [0098]). (emphases added). To solve these problems, Abe proposes a so-

called batch reinforcement learning methods with function approximation, in which <u>the learning does not take place in an online fashion as the learner performs actions and the environment traverses states</u> (paragraph [0099]). (emphasis added). Abe's generating of actionable rules from batch reinforcement learning, which may be analogous to the present invention's generating of channel-specific promotions in response to a customer's request, does not respond to an individual stimulus-response at the time of the individual stimulus-response. Instead, Abe provides batch processing of a history of multiple stimuli-responses.

[0026] In contrast, the present invention clearly claims at least the features of:

"receiving, by said computer a request from said customer from one of said multiple channels;

...

executing, by said computer said request;

<u>with said executing of said request, generating, by said computer a channel-specific promotion</u> based on said updated integrated belief profile", as recited in independent claims 1 and 17, and as similarly recited in claim 9. (emphasis added). That is, upon receiving a request, the present invention then generates a channel-specific promotion.

[0027] Abe, on the other hand, provides batch processing of a history of multiple stimuli-responses and does not generate actionable rules upon receipt of a customer request/an individual stimulus-response.

[0028] For at least the reasons outlined above, Applicants respectfully submit that Abe does not disclose, teach or suggest at least the present invention's features of: "receiving, by said computer a request from said customer from one of said multiple channels; ... executing, by said computer said request; with said executing of said request, generating, by said computer a channel-specific promotion based on said updated integrated belief profile", as recited in currently amended, independent claims 1 and 17, and as similarly recited in currently amended, independent claim 9. Accordingly, Abe fails to anticipate the subject matter of currently amended, independent claims 1, 9, and 17, and dependent claims 4-7 and 12-16 under 35 U.S.C. §102(b). Withdrawal of the rejection of claims 1, 4-7, 9, and 12-17 under 35 U.S.C. §102(b) as anticipated by Abe is respectfully solicited.

B.   The 35 U.S.C. 103(a) Rejection as Unpatentable over Abe and Reiser

1.   The Reiser Disclosure

[0029] It is a fact that Reiser discloses, "The present invention provides a method for automatically learning belief functions, thus providing the ability to determine erroneous information sources, inappropriate information combinations, and optimal information granularities, along with enhanced system performance. The present invention may be embodied in a method of training belief functions, including the steps of gathering information representative of an object or event; creating a set of basic probability assignments based on said set of information; creating combinations of said basic probability assignments; measuring an error present in said basic probability assignments and said combinations of basic probability assignments; calculating updates of said basic probability assignments and said combinations of basic probability assignments based on said error; and modifying said basic probability assignments and said combinations of basic probability assignments with said updates." (col. 2, lines 6-22).

[0030] It is a fact that Reiser discloses, "As shown in FIG. 2, at block 100 the method polls the information sources 20 to extract information. The extracted information will be used to generate a belief function, or bpa. The output of each information source 20 is representative of an observation, a rule, an opinion, or some other measurable phenomenon. The polling of the information source 20 is no different for supervised or unsupervised learning methods. Block 110 performs the function of gathering the information reported by the information sources 20, processing the information into bpa's, and combining the sensor bpa's in a predetermined fashion. For example, the bpa .mu..sub.1 may be based on object shape. A second set of information sources 20, used to produce .mu..sub.2 may be based on object size, while a third bpa .mu..sub.3 may be based on the heat associated with the object. By combining the three bpa's (.mu..sub.1, .mu..sub.2, .mu..sub.3) via Dempster's rule of combination, which is well known in the art, a fourth bpa (.mu..sub.o) is created. This new bpa provides more information as to the identity of object being observed." (col. 3, lines 10-30).

[0031] It is a fact that FIG. 2 of Reiser discloses,

FIG. 2
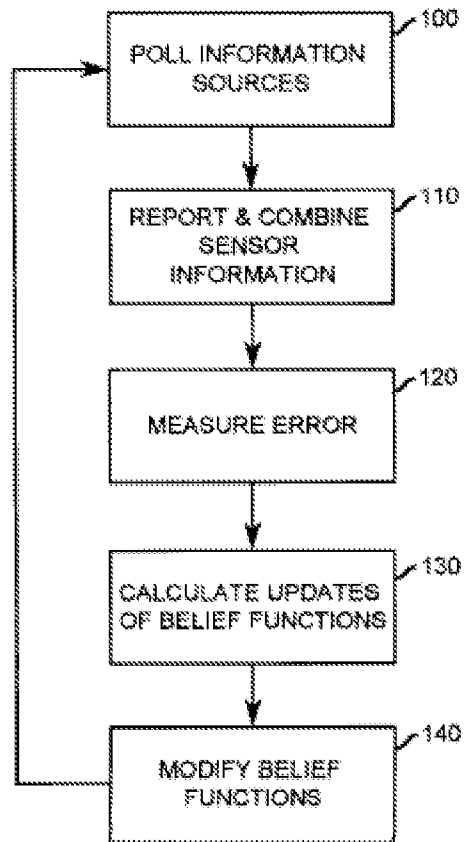
2. Argument

[0032] Resier merely discloses combining belief function via Dempster' rule of combination while automatically learning belief functions. (col. 2, lines 6-22 and col. 3, lines 10-30).

[0033] Resiser does not cure the deficiencies of Abe as argued above.

[0034] Applicants respectfully submit that nowhere does Reiser disclose, teach or suggest at least the present invention's features of: "receiving, by said computer a request from said customer from one of said multiple channels; ... executing, by said computer said request; with said executing of said request, generating, by said computer a channel-specific promotion based on said updated integrated belief profile", as recited in currently amended, independent claims 1 and 17, and as similarly recited in currently amended, independent claim 9.

[0035] Instead, Reiser merely discloses combining belief function via Dempster' rule of combination while automatically learning belief functions. (col. 2, lines 6-22 and col. 3, lines 10-30).

[0036] For at least the reasons outline above with respect to the rejection of the claims over Abe, and for at least the reasons outlined above with respect to the rejection of the claims over Reiser, Applicants respectfully submit that Abe and Reiser, either individually or in combination, do not disclose, teach or suggest at least the present invention's features of: "receiving, by said computer a request from said customer from one of said multiple channels; … executing, by said computer said request; with said executing of said request, generating, by said computer a channel-specific promotion based on said updated integrated belief profile", as recited in currently amended, independent claims 1 and 17, and as similarly recited in currently amended, independent claim 9. Accordingly, Abe and Reiser, either individually or in combination, fail to render obvious the subject matter of currently amended, independent claims 1, 9, and 17, and dependent claims 3, 11, and 18 under 35 U.S.C. §103(a). Withdrawal of the rejection of claims 3, 11, and 18 under 35 U.S.C. §102(b) as unpatentable over Abe and Reiser is respectfully solicited.

III.   Formal Matters and Conclusion

Claims 1, 3-9, and 11-18 are pending in the application.

Applicants respectfully submit that the present claims fulfill the statutory requirements of 35 U.S.C. §112, second paragraph.

With respect to the rejections of the claims over the cited prior art, Applicants respectfully argue that the present claims are distinguishable over the prior art of record. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections to the claims.

In view of the foregoing, Applicants submit that claims 1, 3-9, and 11-18, all the claims presently pending in the application, are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest time possible.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary. Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0441.

Respectfully submitted,

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